It is claimed:

1. An integrated circuit, the integrated circuit couplable to a semiconductor laser and to a photodetector, the photodetector optically couplable to the semiconductor laser, the semiconductor laser capable of transmitting an optical signal in response to a modulation current, and the photodetector capable of converting the optical signal into a photodetector current, the integrated circuit comprising:

a modulator couplable to the semiconductor laser, the modulator capable of providing the modulation current to the semiconductor laser, the modulation current corresponding to an input data signal; and

an extinction ratio controller couplable to the photodetector and coupled to the modulator, the extinction ratio controller, in response to the photodetector current, capable of adjusting the modulation current provided by the modulator to the semiconductor laser to generate the optical signal having substantially a predetermined extinction ratio.

2. The integrated circuit of claim 1, wherein the modulator is capable of providing a first modulation current level to the semiconductor laser when the input data signal has a first logical state and providing a second modulation current level to the semiconductor laser when the input data signal has a second logical state, the first modulation current level being greater than the second modulation current level; wherein the semiconductor laser is capable of providing the optical signal having a first optical power level in response to the first modulation current level and having a second optical power level in response to the second modulation current level, the first optical power level being greater than the second optical power level; and wherein the photodetector is further capable of generating a first photodetector current level in response to the first optical power level and a second photodetector current level in response to the second optical power level.

3. The integrated circuit of claim 2, wherein the extinction ratio controller is further capable of:

sampling the first photodetector current level to form a plurality of first photodetector current indicators;

sampling the second photodetector current level to form a plurality of second photodetector current indicators;

determining a measured extinction ratio as a ratio of a first arithmetic mean of the plurality of first photodetector current indicators to a second arithmetic mean of the plurality of second photodetector current indicators;

determining a variance between the measured extinction ratio and the predetermined extinction ratio, and based on the variance, forming an extinction ratio error signal.

4. The integrated circuit of claim 3, wherein the extinction ratio controller is further capable of integrating the extinction ratio error signal with a plurality of previous extinction ratio error signals to form an integrated extinction ratio error signal; and wherein the extinction ratio controller is further capable of adjusting the modulation current by providing a selected current path for the modulator, the selected current path corresponding to the integrated extinction ratio error signal.

5. The integrated circuit of claim 2, wherein the extinction ratio controller is capable of sampling the first photodetector current level to form a first photodetector current indicator, sampling the second photodetector current level to form a second photodetector current indicator, determining a measured extinction ratio as a ratio of the first photodetector current indicator to the second photodetector current indicator, determining a variance between the measured extinction ratio and the predetermined extinction ratio and, based on the variance, forming an extinction ratio error signal.

6. The integrated circuit of claim 5, wherein the extinction ratio controller is capable of sampling the first photodetector current level and the second photodetector current level by sampling corresponding voltage levels.

7. The integrated circuit of claim 5, wherein the extinction ratio controller is enabled to sample the first photodetector current level when the input data signal has a predetermined number of consecutive bits having the first logical state and is enabled to sample the second photodetector current level when the input data signal has a predetermined number of consecutive bits having the second logical state.

8. The integrated circuit of claim 5, wherein the extinction ratio controller is enabled to sample the first photodetector current level when the input data signal has the first logical state for a predetermined period of time and is enabled to sample the second photodetector current level when the input data signal has the second logical state for the predetermined period of time.

9. The integrated circuit of claim 5, wherein the extinction ratio controller is further capable of integrating the extinction ratio error signal with a plurality of previous extinction ratio error signals to form an integrated extinction ratio error signal; and wherein the extinction ratio controller is further capable of adjusting the modulation current in response to the integrated extinction ratio error signal.

10. The integrated circuit of claim 5, wherein the extinction ratio controller is further capable of integrating the extinction ratio error signal with a plurality of previous extinction ratio error signals to form an integrated extinction ratio error signal; and wherein the extinction ratio controller is further capable of adjusting the modulation current by providing a selected current path for the modulator, the selected current path corresponding to the integrated extinction ratio error signal.

11. The integrated circuit of claim 5, wherein the extinction ratio controller is further capable of providing, in response to the extinction ratio error signal, a modulation current adjustment signal to the modulator, and wherein, in response to the modulation current adjustment signal, the modulator is further capable of adjusting the first modulation current level and the second modulation current level for the semiconductor

laser to generate the optical signal having a substantially constant, predetermined extinction ratio.

12. The integrated circuit of claim 2, wherein the extinction ratio controller further comprises:

a sampler coupled to the photodetector, the sampler capable of sampling the first photodetector current level to form a plurality of first photodetector current indicators and sampling the second photodetector current level to form a plurality of second photodetector current indicators; and

a modulation current controller coupled to the sampler and to the modulator, the modulation current controller capable of determining a measured extinction ratio as a ratio of a first arithmetic mean of the plurality of first photodetector current indicators to a second arithmetic mean of the plurality of second photodetector current indicators, and comparing the measured extinction ratio to the predetermined extinction ratio to form an extinction ratio error signal.

13. The integrated circuit of claim 2, wherein the extinction ratio controller further comprises:

a sampler coupled to the photodetector, the sampler capable of sampling the first photodetector current level to form a first photodetector current indicator and sampling the second photodetector current level to form a second photodetector current indicator; and

a modulation current controller coupled to the sampler and to the modulator, the modulation current controller capable of determining a measured extinction ratio as a ratio of the first photodetector current indicator to the second photodetector current indicator, and further capable of comparing the measured extinction ratio to the predetermined extinction ratio to form an extinction ratio error signal.

14. The integrated circuit of claim 13, wherein the sampler further comprises:

an analog-to-digital converter coupled to the photodetector, the analog-to-digital converter capable of sampling the first photodetector current level to form a first photodetector current indicator and sampling the second photodetector current level to form a second photodetector current indicator; and

a timer coupled to the analog-to-digital converter, the timer capable of enabling the analog-to-digital converter to sample the first photodetector current level when the input data signal has a predetermined number of consecutive bits having the first logical state and enabling the analog-to-digital converter to sample the second photodetector current level when the input data signal has a predetermined number of consecutive bits having the second logical state.

15. The integrated circuit of claim 13, wherein the sampler further comprises:

an analog-to-digital converter coupled to the photodetector, the analog-to-digital converter capable of sampling the first photodetector current level to form a first photodetector current indicator and sampling the second photodetector current level to form a second photodetector current indicator; and

a timer coupled to the analog-to-digital converter, the timer capable of enabling the analog-to-digital converter to sample the first photodetector current level when the input data signal has the first logical state for a predetermined period of time and enabling the analog-to-digital converter to sample the second photodetector current level when the input data signal has the second logical state for the predetermined period of time.

16. The integrated circuit of claim 13, wherein the sampler further comprises:

a first register coupled to the analog-to-digital converter, the first register capable of storing the first photodetector current indicator when the input data signal has a first logical state; and

a second register coupled to the analog-to-digital converter, the second register capable of storing the second photodetector current indicator when the input data signal has a second logical state.

17. The integrated circuit of claim 13, wherein the modulation current controller further comprises:

an extinction ratio calculator coupled to the sampler, the extinction ratio calculator capable of determining a measured extinction ratio as a ratio of the first photodetector current indicator to the second photodetector current indicator; and

an extinction ratio error generator coupled to the extinction ratio calculator, the extinction ratio error generator capable of determining a variance between the measured extinction ratio and the predetermined extinction ratio and, corresponding to the variance, forming the extinction ratio error signal.

18. The integrated circuit of claim 17, wherein the modulation current controller further comprises:

an extinction ratio integrator coupled to the extinction ratio error generator, the extinction ratio integrator capable of summing the extinction ratio error signal with a plurality of previous extinction ratio error signals to form an integrated extinction ratio error signal; and

a digital-to-analog converter coupled to the extinction ratio integrator, the digital-to-analog converter capable of adjusting the modulator current by providing a selected current path for the modulator, the selected current path corresponding to the integrated extinction ratio error signal.

19. A method of controlling an extinction ratio of a semiconductor laser, the method comprising:

(a) modulating the semiconductor laser at a first modulation level when the input data signal has a first logical state and modulating the semiconductor laser at a second modulation level when the input data signal has a second logical state;

(b) transmitting an optical signal having a first optical power level in response to the first modulation level and having a second optical power level in response to the second modulation level, the first optical power level being greater than the second optical power level;

(c) detecting the first optical power level and the second optical power level;

(d) determining a measured extinction ratio as a ratio of the detected first optical power level to the detected second optical power level;

(e) determining an extinction ratio error as a variance between the measured extinction ratio and a predetermined extinction ratio; and

(f) using the extinction ratio error, adjusting the modulation of the semiconductor laser to generate the optical signal having substantially the predetermined extinction ratio.

20. The method of claim 19, wherein step (f) further comprises:

integrating the extinction ratio error with a plurality of previous extinction ratio errors to form an integrated extinction ratio error; and

adjusting the modulation of the semiconductor laser in response to the integrated extinction ratio error.

21. The method of claim 19, wherein step (f) further comprises:

integrating the extinction ratio error with a plurality of previous extinction ratio errors to form an integrated extinction ratio error; and

adjusting the modulation of the semiconductor laser by providing a selected current path for the modulator, the selected current path corresponding to the integrated extinction ratio error.

22. The method of claim 19, wherein step (c) further comprises:

detecting the first optical power level by sampling a first photodetector current generated by the first optical power level to form a first photodetector current indicator and detecting the second optical power level by sampling a second photodetector current generated by the second optical power level to form a second photodetector current indicator.

23. The method of claim 22, wherein the sampling of the first photodetector current and the second photodetector current is performed by sampling corresponding voltage levels.

24. The method of claim 22, wherein step (d) further comprises:

determining the measured extinction ratio as a ratio of a first arithmetic mean of a plurality of samples of the first photodetector current to a second arithmetic mean of a plurality of samples of the second photodetector current.

25. The method of claim 22, wherein step (d) further comprises:

determining the measured extinction ratio as a ratio the first photodetector current indicator to the second photodetector current indicator.

26. The method of claim 22, wherein step (c) further comprises:

sampling the first photodetector current level when the input data signal has a predetermined number of consecutive bits having the first logical state and sampling the second photodetector current level when the input data signal has a predetermined number of consecutive bits having the second logical state.

27. The method of claim 22, wherein step (c) further comprises:

sampling the first photodetector current level when the input data signal has the first logical state for a predetermined period of time and sampling the second

photodetector current level when the input data signal has the second logical state for the predetermined period of time.

28. An apparatus comprising:

a semiconductor laser capable of transmitting an optical signal having a first optical power level in response to a first modulation current level and having a second optical power level in response to a second modulation current level, the first optical power level being greater than the second optical power level;

a modulator coupled to the semiconductor laser, the modulator capable of providing the first modulation current level to the semiconductor laser when the input data signal has a first logical state and providing the second modulation current level to the semiconductor laser when the input data signal has a second logical state, the first modulation current level being greater than the second modulation current level;

a photodetector optically coupled to the semiconductor laser, the photodetector capable of generating a first photodetector current level in response to the first optical power level and a second photodetector current level in response to the second optical power level;

a sampler coupled to the photodetector, the sampler capable of sampling the first photodetector current level to form a first photodetector current indicator and sampling the second photodetector current level to form a second photodetector current indicator; and

a modulation current controller coupled to the sampler and to the modulator, the modulation current controller capable of determining a measured extinction ratio as a ratio of the first photodetector current indicator to the second photodetector current indicator; determining a variance between the measured extinction ratio and a predetermined extinction ratio and, based on the variance, forming an extinction ratio error signal; and in response to the extinction ratio error signal, further capable of adjusting the modulation current provided by the modulator to the semiconductor laser to generate the optical signal having substantially the predetermined extinction ratio.

29. The apparatus of claim 28, wherein the sampler is further capable of sampling the first photodetector current level to form a plurality of first photodetector current indicators and sampling the second photodetector current level to form a plurality of second photodetector current indicators; and wherein the modulation current controller is further capable of determining the measured extinction ratio as a ratio of a first arithmetic mean of the plurality of first photodetector current indicators to a second arithmetic mean of the plurality of second photodetector current indicators, and determining a variance between the measured extinction ratio and the predetermined extinction ratio, and based on the variance, forming the extinction ratio error signal.

30. The apparatus of claim 28, wherein the modulation current controller is further capable of integrating the extinction ratio error signal with a plurality of previous extinction ratio error signals to form an integrated extinction ratio error signal; and wherein the modulation current controller is further capable of adjusting the modulation current by providing a selected current path for the modulator, the selected current path corresponding to the integrated extinction ratio error signal.

31. The apparatus of claim 28, wherein the sampler further comprises:

a timer capable of enabling the sampling of the first photodetector current level when the input data signal has a predetermined number of consecutive bits having the first logical state and enabling the sampling of the second photodetector current level when the input data signal has a predetermined number of consecutive bits having the second logical state.

32. The apparatus of claim 28, wherein the sampler further comprises:

a timer capable of enabling the sampling of the first photodetector current level when the input data signal has the first logical state for a predetermined period of time and enabling the sampling of the second photodetector current level when the input data signal has the second logical state for the predetermined period of time.

33. The apparatus of claim 28, wherein the modulation current controller is further capable of providing, in response to the extinction ratio error signal, a modulation current adjustment signal to the modulator, and wherein, in response to the modulation current adjustment signal, the modulator is further capable of adjusting the first modulation current level and the second modulation current level for the semiconductor laser to generate the optical signal having substantially the predetermined extinction ratio.

34. The apparatus of claim 28, wherein the sampler further comprises:

a first register capable of storing the first photodetector current indicator when the input data signal has a first logical state; and

a second register capable of storing the second photodetector current indicator when the input data signal has a second logical state.